Session 611

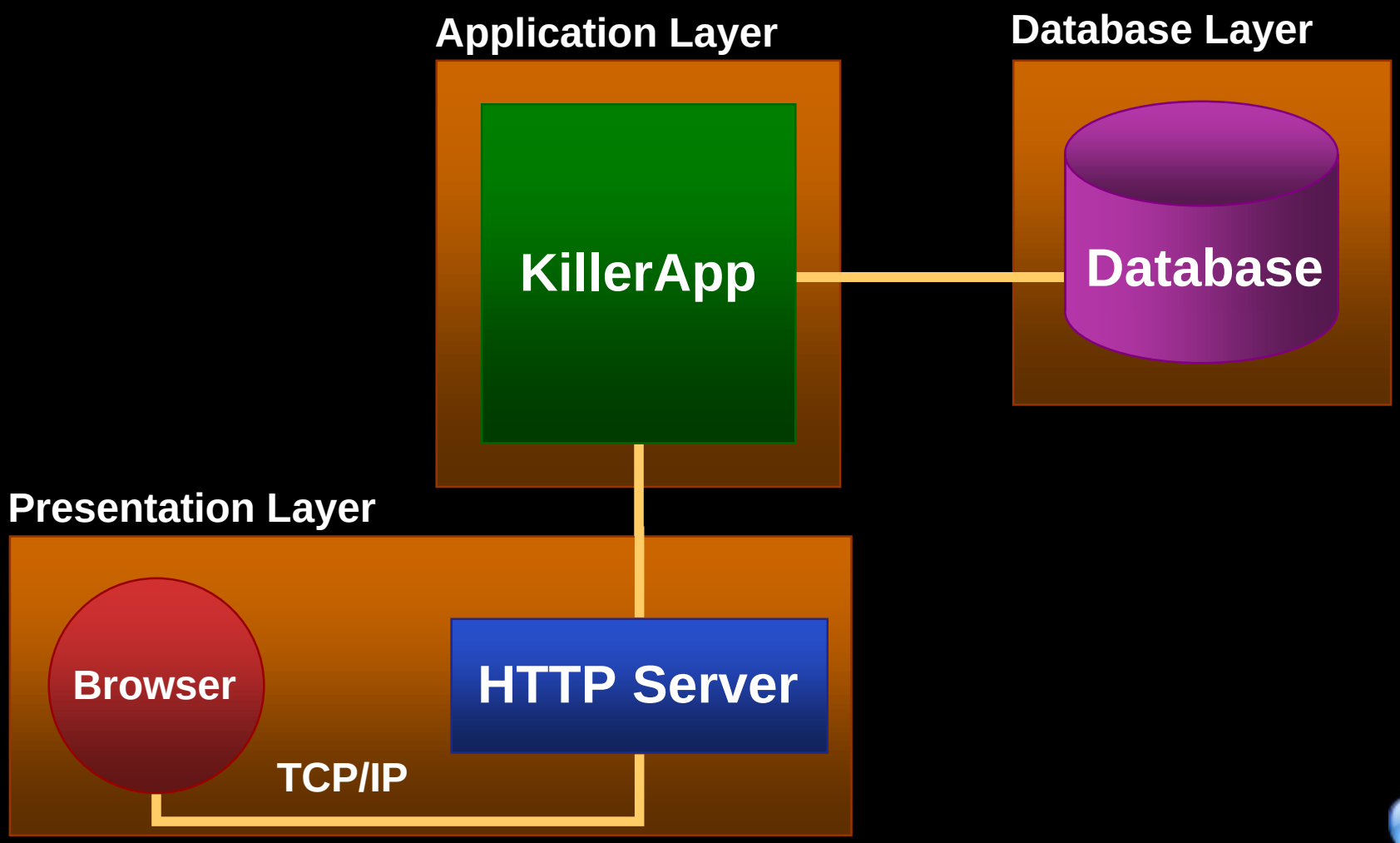
Deploying WebObjects Applications

Karl Hsu
WebObjects Engineer

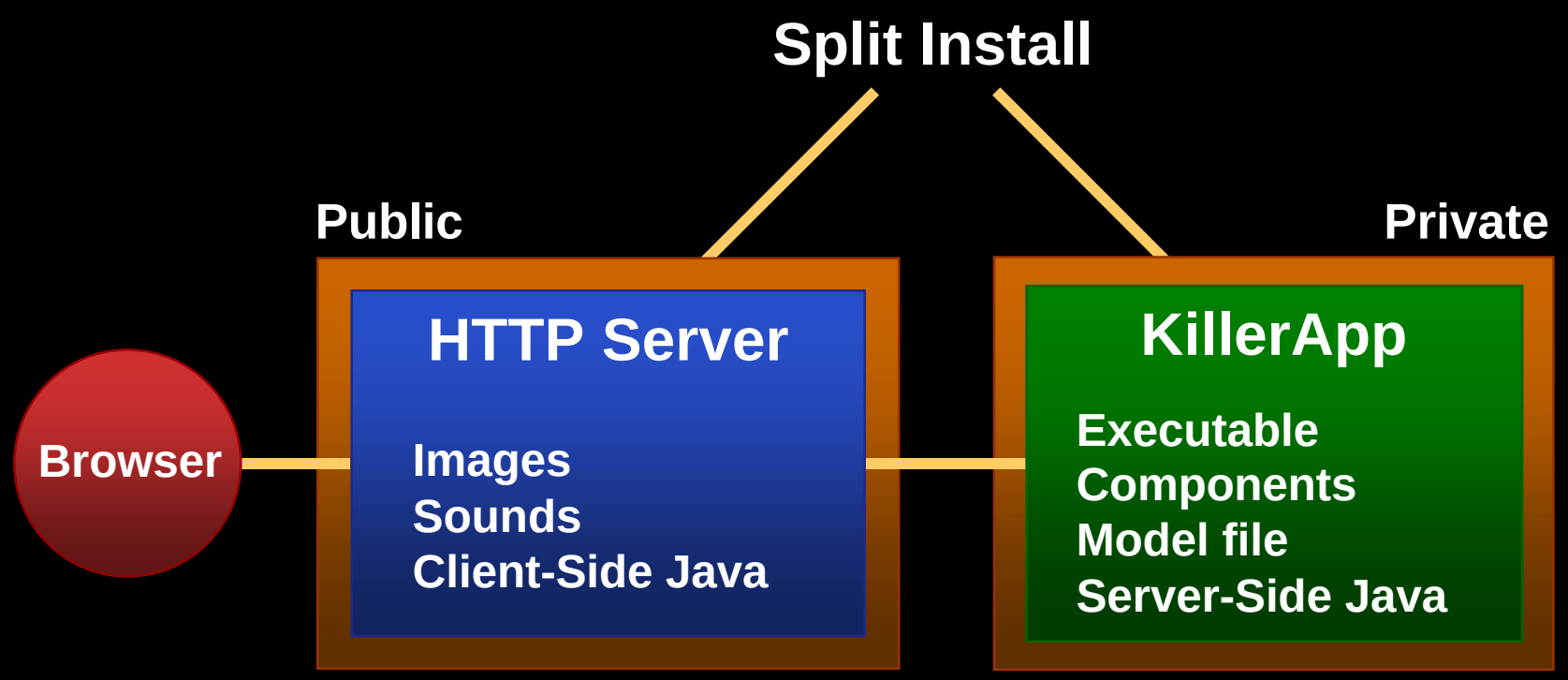
Introduction

- Deployment overview
- Configuration
- Systems monitoring
- Typical deployment
- Questions & Answers

Deployment Architecture



Public and Private Resources



Deployment Configuration

Supported Deployment Platforms

- Mac OS X Server
- Windows 2000
- Solaris 2.8

- Requires JRE 1.3 or higher

Deployment Configuration

Hardware Considerations

- Processor type
- Processor speed
- Processor count
- RAM
- Disk space
- Redundancy

Deployment Configuration

Location Considerations

- Network speed
- Network security
- Physical security
- Temperature control
- Uninterruptible Power Supply

Deployment Configuration

Software Considerations

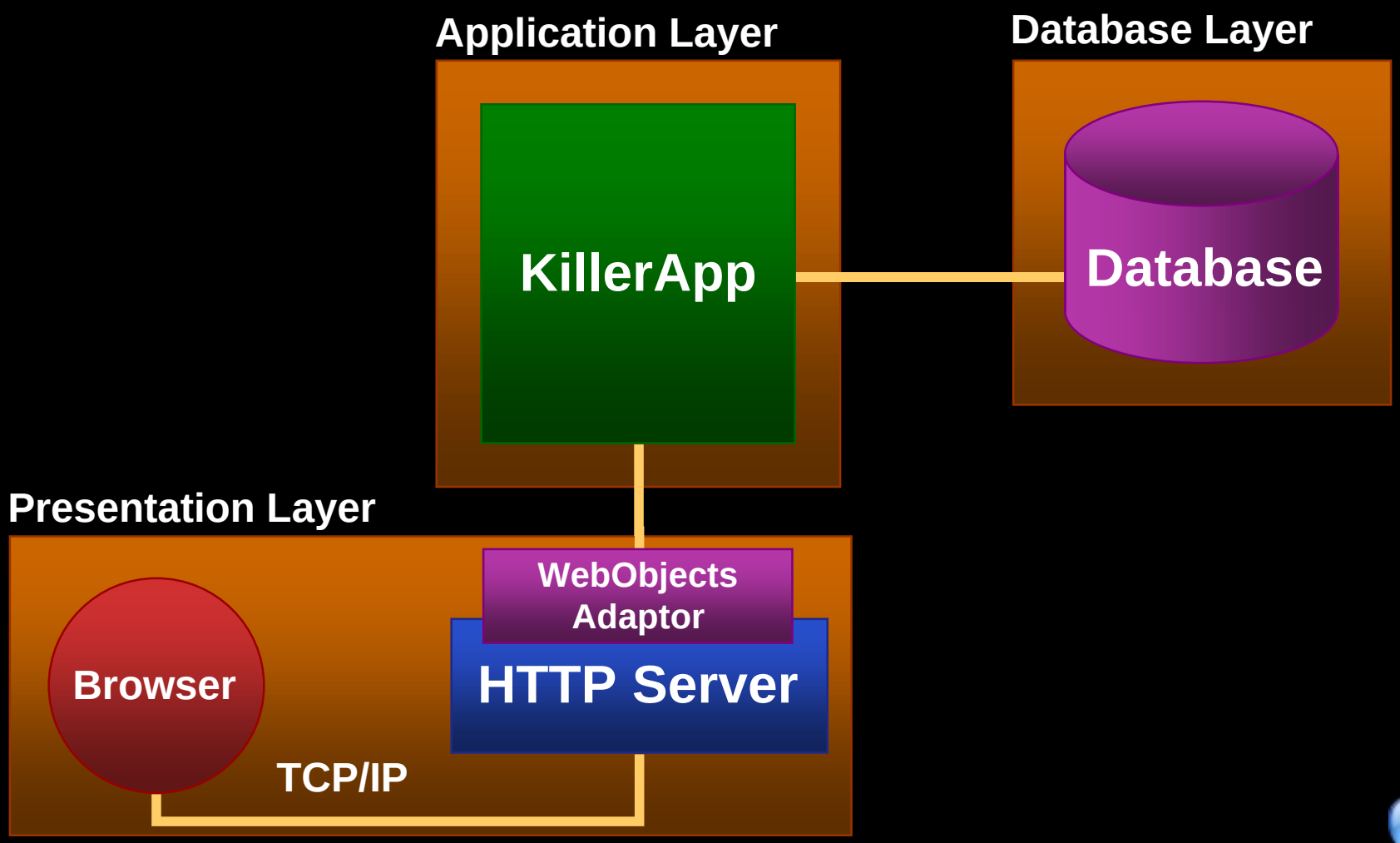
- Account for applications
- Application logging
- Access control

What Can We Control?

Deployment Dependant

- WebObjects adaptor
- Application
- Database

Deployment Architecture



WebObjects Adaptor

- Forwards requests from the client to the WebObjects application
- What does it do for me?
  - Better performance
  - Validation of client requests
  - Security

WebObjects Adaptor

- CGI
  - Works everywhere
  - Slow—requires forking a process for each request
  - Does not support load balancing on Windows
- API
  - Apache, NSAPI, and ISAPI plug-ins
  - Fast, but can only be used with specific web servers
  - Support load balancing
- C source code provided

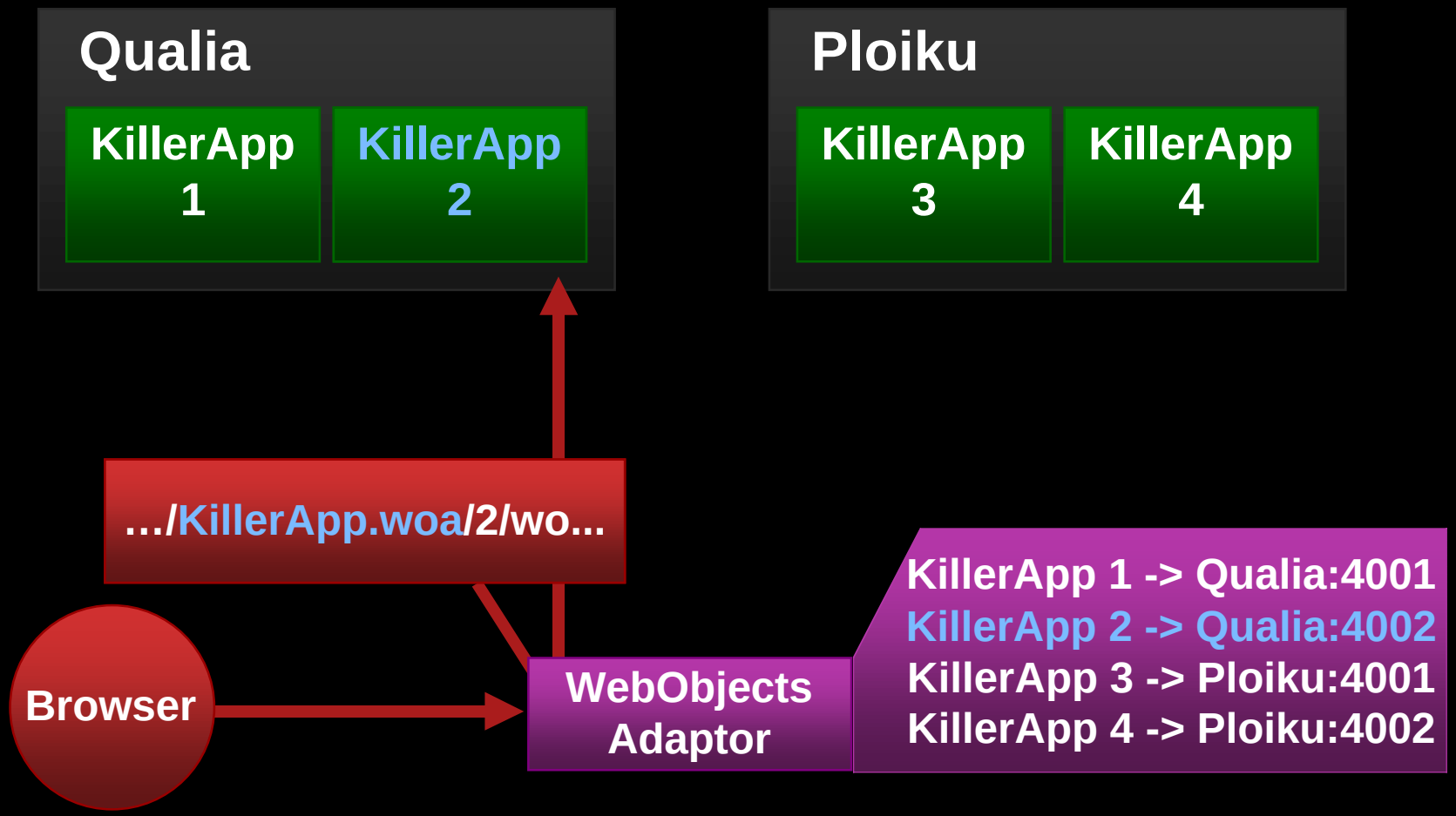
Supported Adaptors

	OS X	Solaris	Win2K
Apache	●	●	
NSAPI	●	●	●
ISAPI			●
CGI	●	●	●

What Is Load-Balancing?

- The distribution of client requests between multiple instances of your application
  - Only load balance requests without sessions
- Types of load balancing
  - Random
  - Round robin
  - Load average

Adaptor Overview



Adaptor Site Configuration

- Maps application name + instance ID to application server + TCP/IP port
  - KillerApp 1 -> Qualia:4001
  - KillerApp 2 -> Qualia:4002
  - KillerApp 3 -> Ploiku:4001
  - KillerApp 4 -> Ploiku:4002
- Additional options
  - Load balancing type
  - Number of persistent connections to the application
  - Socket options

Adaptor Configuration

- Three mechanisms to get configuration
  - Flatfile

    file:///Library/WebObjects/Configuration/WOConfig.xml
  - Hostlist

    http://Ploiku:1085,http://Qualia:1085
  - Multicast

    webobjects://239.128.14.2:1085
- Updated every 10 seconds by default

Flatfile Configuration

- XML format
- DTD defined in the documentation
- Example:

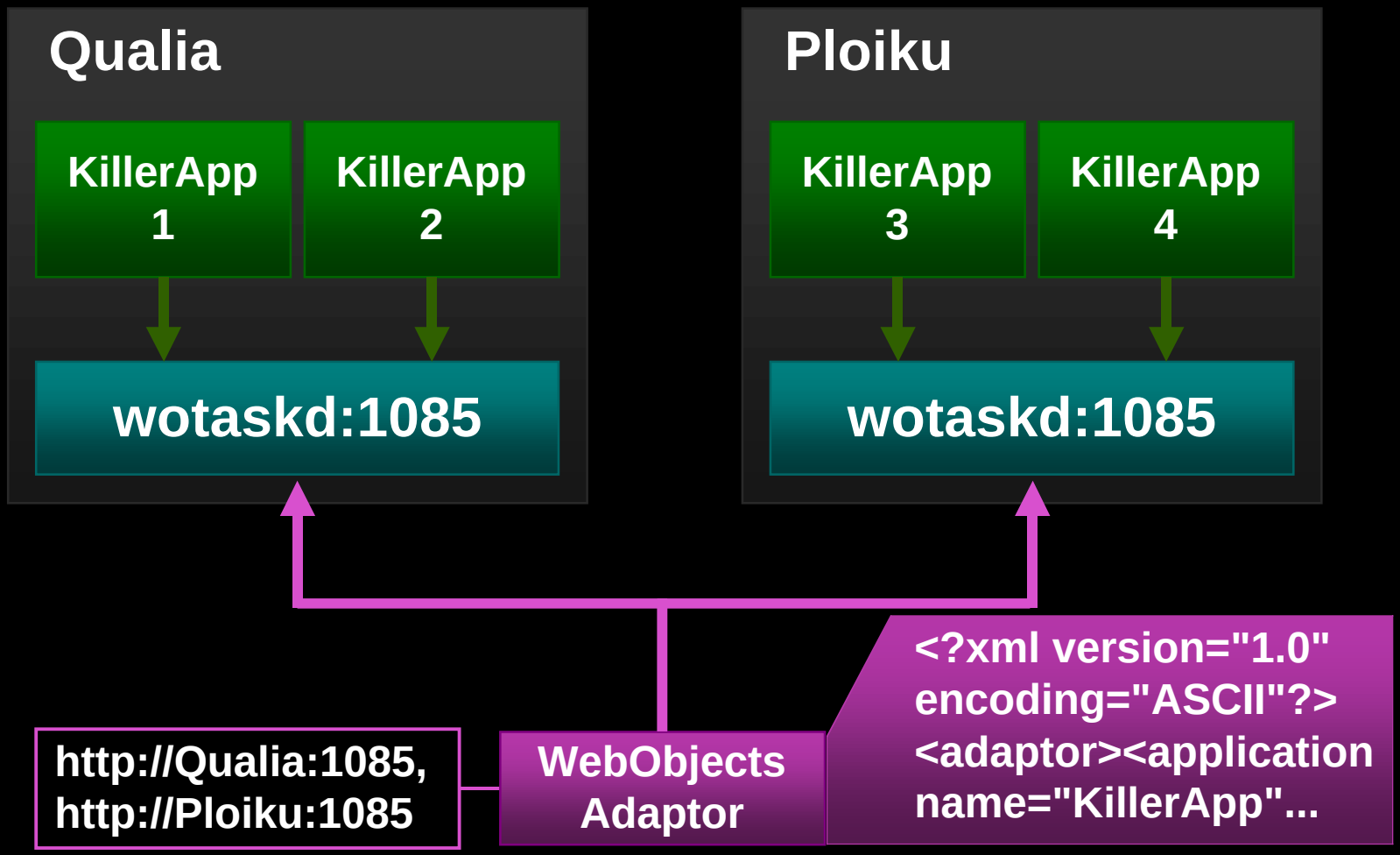
```
<adaptor>
    <application name="KillerApp"
    scheduler="ROUNDROBIN">
        <instance id="1" host="Qualia"
    port="4001"/>
    </application>
</adaptor>
```

Hostlist Configuration

- Requests dynamic configuration info from a list of hosts
  - Information supplied by a WebObjects Task Daemon (wotaskd) running on each host
  - Information supplied in the same XML format as Flatfile
  - Allows dynamic addition of application instances on known hosts
- Default mechanism for adaptors

  http://localhost:1085

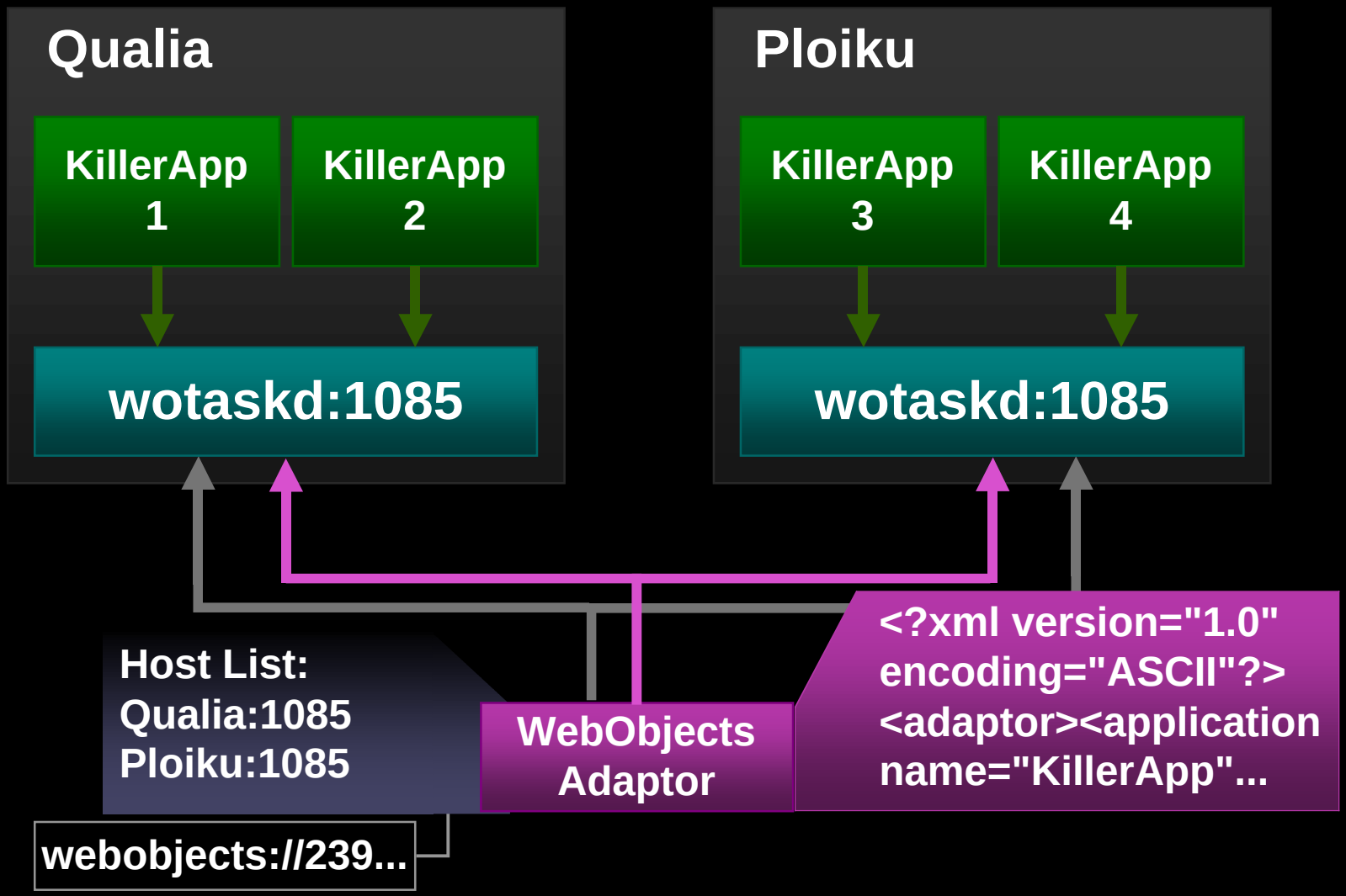
The Adaptor and Hostlist



Multicast Configuration

- Broadcasts UDP to a specific IP address + TCP/IP port
  - webobjects://239.128.14.2:1085
  - Limited to subnet by default
  - Routers can be configured to pass multicast packets to other subnets
- Dynamically builds list of available hosts
  - wotaskd(s) respond to the adaptor's multicast query
  - Configuration proceeds exactly like Hostlist
  - Default host rediscovery is every 100 seconds

The Adaptor and Multicast



wotaskd—WebObjects Task Daemon

- Started at boot on Mac OS X and Solaris, and at login on Windows 2000
- Watched over by a daemon process
- Supplies adaptor with dynamic configuration data
  - XML data is served on port 1085
- Registers running instances on the same machine
- Monitors, cycles, and restarts configured instances
- Configured using JavaMonitor

JavaMonitor

- WebObjects application
- Web interface to wotaskd
  - Configure application instances
  - Manage multiple hosts
  - Configure WebObjects adaptor
  - Set up scheduling of instances
- Can be password protected
- New interface in WebObjects 5

Instance Scheduling

- Each instance can be scheduled independently
  - A scheduled instance is restarted periodically by wotaskd
- 3 Types of scheduling
  - Hourly
  - Daily
  - Weekly
- Can terminate instances immediately or gracefully

Demo

Monitor

Josh Behnke
WebObjects Engineer

Adaptor Info Page

- View adaptor status
  - **http://Matilda/cgi-bin/WebObjects/WOAdaptorInfo**
  - Detailed configuration information
  - Links to all available instances
  - Disabled by default, for security reasons
  - Can be password protected or public access

Adaptor Logging

- Enabling adaptor logging
  - Create file named logWebObjects in the temp directory
  - Log file named WebObjects.log will be generated
  - Logging can be started/stopped without restarting the web server

Instance Configuration

- Done using standard Java java.util.Properties
  - Properties file from all included frameworks
  - Properties file from application .woa
  - Command-line arguments
- Properties file
  - Named "Properties" and located in the resources directory of the .woa or .framework
  - Java format (multi-line, with each line 'key=value')
- Command-line arguments
  - Passed as '**-Dproperty.name=propertyValue**'

Useful Properties

- WOPort
- WOHost
- WODebuggingEnabled
- WOOutputPath
- WOCachingEnabled
- WOListenQueueSize
- WOAllowsConcurrentRequestHandling
- WOWorkerThreadCountMin
- WOWorkerThreadCountMax

Properties (Configuration)

- WOPort <port number>
  - Listen for requests on a specific TCP/IP port
  - Arbitrarily chosen if not set
- WOHost <IP address or hostname>
  - Bind the listen socket to a specific IP or hostname
  - Used only for hosts with multiple IP addresses
  - Default (first) hostname if not set

Properties (Logging)

- WODebuggingEnabled <true/false>
  - Enables some debugging information output
  - See NSLog for details
- WOOutputPath <path>
  - Will redirect debugging output to a specified file
  - Normally will output to stdout and stderr

Properties (Performance I)

- WOCachingEnabled <true/false>
  - Caches WebObjects components in memory, rather than reading from the filesystem
  - True for deployment, false for development
- WOListenQueueSize <count>
  - Number of outstanding requests at any time
  - Defaults to 128
- WOAllowsConcurrentRequestHandling<true/false>
  - Determines whether requests are processed in serial
  - Defaults to false
  - Requires that your code be threadsafe!

Properties (Performance II)

- WOWorkerThreadCountMin <count>
  - Starting number of threads for processing incoming requests
  - Defaults to 16
- WOWorkerThreadCountMax <count>
  - Maximum number of threads to create for processing incoming requests
  - Defaults to 256
  - Setting it to -1 will allow infinite growth

Potential Bottlenecks

- Application
- Database
- CPU
- Virtual Memory/RAM
- Network

See—**618 Optimizing WebObjects Applications**

Memory/CPU Monitoring Tools

- Mac OS X
  - CPU Monitor
  - Process Viewer
  - vm_stat
- Solaris
  - ps
  - top
- Windows
  - Task Manager

Network Monitoring Tools

- Mac OS X
  - Network Utility
- Solaris
  - netstat
- Windows
  - Network Monitor
- Packet Sniffers
  - Hardware
  - tcpdump

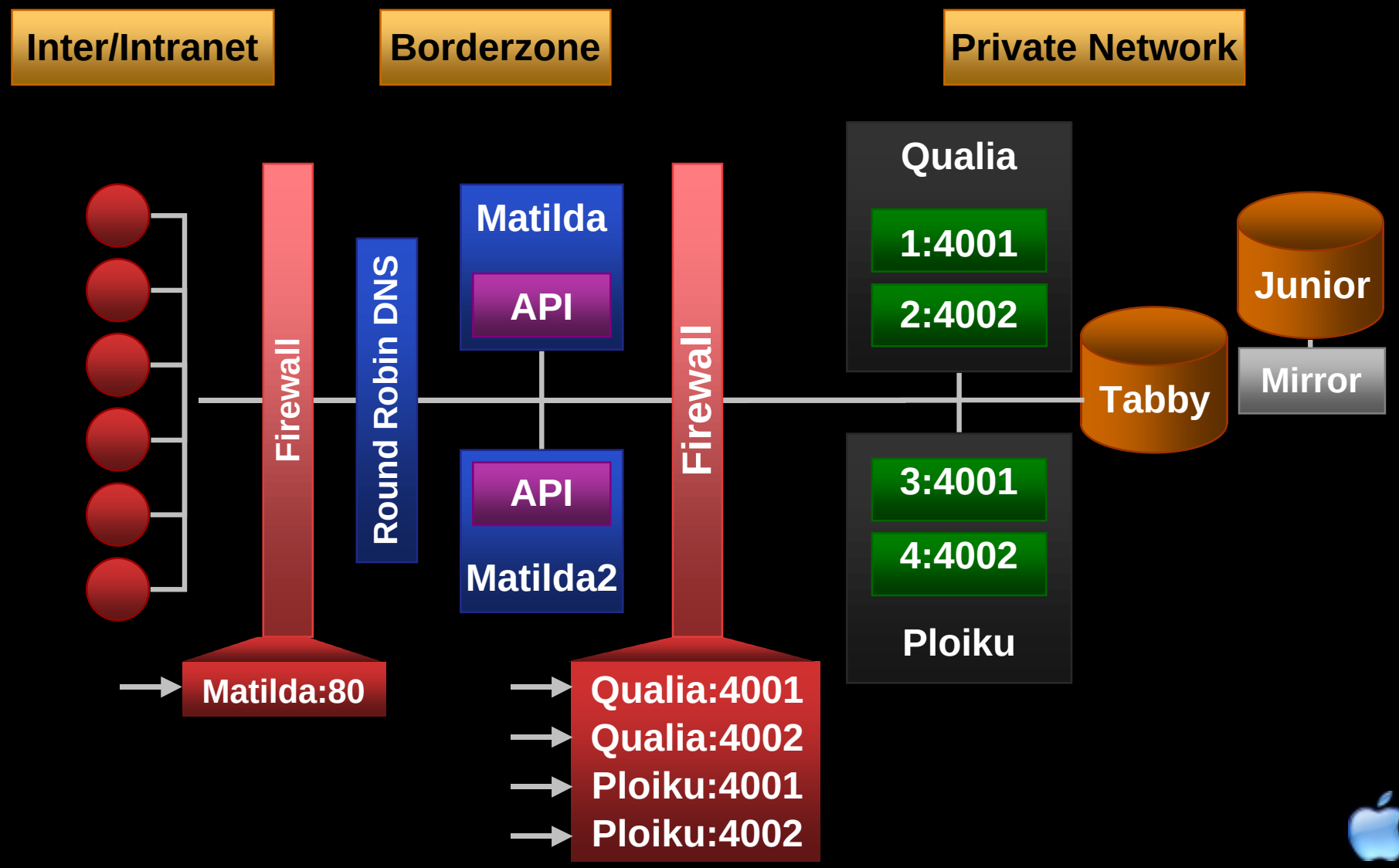
Application Monitoring Tools

- Standard Java tools
  - Jprobe
  - OptimizeIt
- External load generators
  - Playback Manager
  - Silk Performer
- WebObjects frameworks
  - WOEvents
  - WOStats

Typical Deployment

- Deployment principles are the same
  - Small Apps—Home based—cable or DSL
  - Mid Sized—Small Business—fractional T1
  - Large—Enterprise—multiple T1

Sample Deployment



WebObjects Lab

- Located downstairs in Room K
- Lab hours
  - Monday 12:00pm–6:00pm
  - Tuesday 10:30am–6:00pm
  - Wednesday 10:30am–6:00pm
  - Thursday 10:30am–6:00pm
  - Friday 10:30am–3:30pm

☑ Vote for WebObjects as Best App Server

http://developer.apple.com/webobjects

Roadmap

504 Java Performance	Room C **Wed., 3:30pm**
618 Optimizing WebObjects Applications	Room A1 **Fri., 2:00pm**
FF111 Feedback Forum: WebObjects	Room A1 **Fri., 3:30pm**

Who to Contact

Toni Trujillo Vian
Director, WebObjects Engineering
webobjects@apple.com

Bob Fraser
WebObjects Product Manager
webobjects@apple.com

iServices Consulting, Integration, Training & Certification
(800) 848-6398
iservices@apple.com

For more information:
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Q&A

Bob Fraser
WebObjects Product Manager
webobjects@apple.com

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